## Cierva Skeeter Flies . . . . .

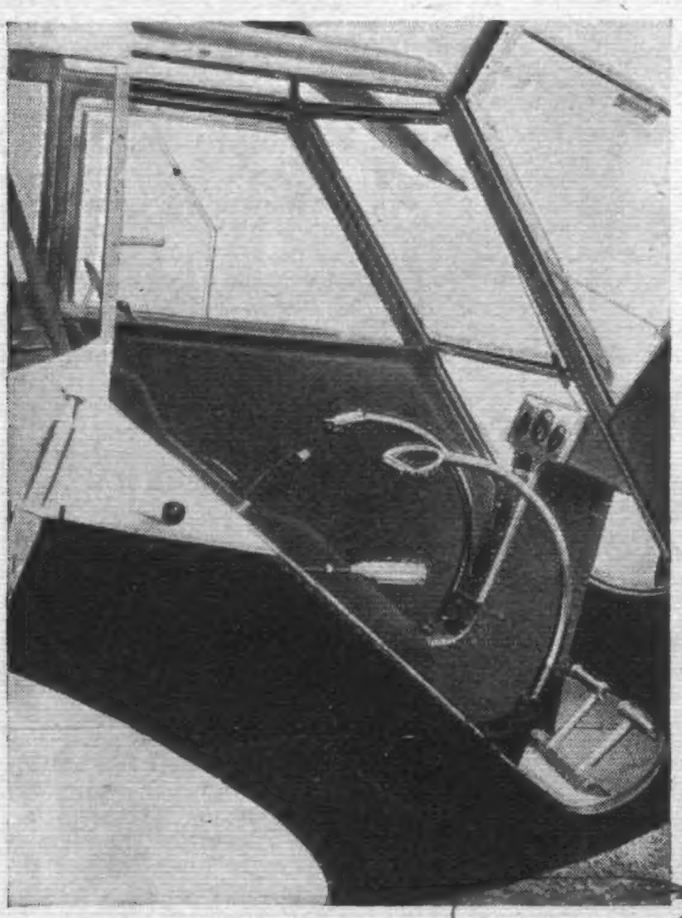
pleasure in having our early faith vindicated as completely as it is by the performance figures set out in the A.R.B. Civil Type Approval Certificate. This is, of course, a quite exhaustive document, and for reasons of space we can abstract only a few of the more interesting items. Nevertheless, these are more than sufficient to establish the extraordinary operational factors of the engine.

Before giving figures it may be useful briefly to recapitulate the salient features of the FF 1. In general terms, apart from the use of a two-pin crankshaft, the layout accords with normal flat-four practice. This, however, excludes the application of Mr. Jameson's heterodox induction theory. In brief, this theory postulates the total suppression of turbulence in order to obtain what can best be described as progressive stratification of mixture strength, from a small lodgment of rich mixture adjacent to the sparking plug, down to almost pure air adjacent to the piston crown.

In practice, this form of induction gives quite unusual running characteristics. The very high proportion of diluent air carries away the radiant heat and thus gives very low running temperatures. At the same time, the extremely weak mixtures (the rich-mixture setting is of the order of 20:1) make possible the amazingly low specific consumption figures. The "long-term" power stroke, bringing about as it does a change in the indicator diagram entropy, permits unusually high b.m.e.p.s to be recorded in conjunction with very smooth running and a cruising rating of 92 per cent full throttle.

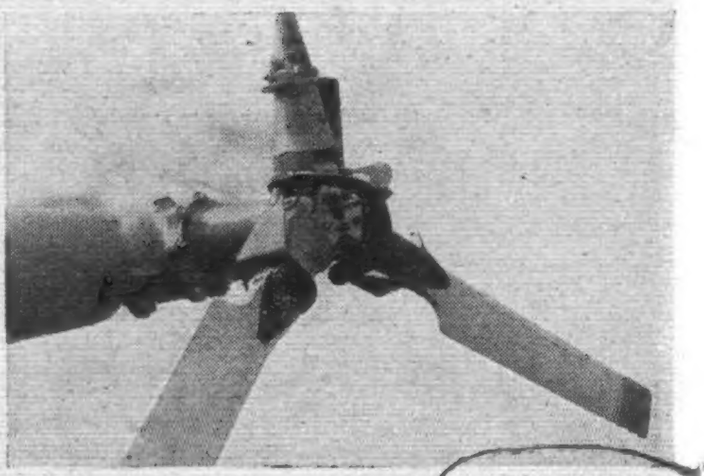
### Power Maintenance at Height

These few highlights are sufficient to indicate the unorthodox qualities of the Jameson engine and, in turn, to raise the possibility that, due to the excess air (relative to the requirements of combustion) passed through the engine, it may well be possible that the sea level power ratings will be maintained up to that altitude at which the excess oxygen breathed by the unit will compensate the reduction in ambient density. Further, it has been established that the power/r.p.m. curve of the engine falls remarkably closely to the power/r.p.m. requirements of its airscrew, and the result is that, in most respects, virtually the same performance will be obtained with a fixed-pitch as with a variable-pitch airscrew when used in conjunction with this power unit in a fixed-wing aircraft.



"Flight" photograph.

*Dual controls of the Skeeter. Cyclic pitch is controlled by the curved columns, and there are separate levers for the collective pitch control.*



"Flight" photograph.

*The usual collective pitch control of the three-bladed tail rotor is very light and could not well be much more simple.*

For helicopter applications, the important and peculiar qualities of the FF 1 are the smooth running characteristics over the whole power range; the close relation of cruising and full-throttle powers; and, perhaps most important of all, the very low running temperatures. This last quality means that the cooling drag penalty imposed is very small. It is almost impossible to arrange an air-cooling system for a helicopter engine without employing a fan, and, as the power absorbed by a cooling fan is a direct deduction from the shaft power available for take-off, the lower the cooling demands made by the engine the better. It is in this regard that the Jameson engine's requirement of a cooling depression across the cylinder of but 4 to 5in water gauge at full throttle is so very important an advantage. We believe we are right in saying that, in the case of the Skeeter, it is possible to take-off at little over half-throttle, this being in no small measure due to the negligible abstraction of power for cooling.

The Air Registration Board has approved the engine for clearance in civil aircraft classified in the special category sub-divisions F, G, H and I, and in the Board's Civil Type Approval Certificate, the following performance values are approved:

**JAMESON FF 1 ENGINE**

| | |
|---|---|
| Bore | 4.125in |
| Stroke | 3.75in |
| Compression ratio | 7.4 : 1 |
| Swept volume | 3.28 litres |
| Airscrew reduction gear ratio | 0.619 : 1 |
| Net dry weight | 290 lb. + 2½ per cent |

**Performance**

| | |
|---|---|
| Max. take-off power | 102/106 b.h.p. |
| Max. take-off r.p.m. | 3,050 |
| Specific fuel consumption | 0.44/0.47 pints/b.h.p./hr |
| Max. continuous power | 88/92 b.h.p. |
| Max. continuous r.p.m. | 2,800 |
| Specific fuel consumption | 0.41/0.43 pints/b.h.p./hr |

**Ratings**

| R.P.M. | 2,400 | 2,500 | 2,600 | 2,700 | 2,800 | 2,900 | 3,050 | |
|---|---|---|---|---|---|---|---|---|
| Full throttle at sea level, rich mixture | 90 | 93 | 96 | 99 | 101 | 103 | 106 | b.h.p. |
| Full throttle at sea level, weak mixture | 88 | 89 | 90 | 91 | 92 | | | b.h.p. |
| Negative power intercept at zero density | 8.5 | 9.0 | 9.5 | 10.5 | 11.0 | 12.0 | 13.5 | b.h.p. |

**Cooling**

| | |
|---|---|
| Max. take-off cylinder temperature | 185 deg. C |
| Max. continuous cylinder temperature | 165 deg. C |
| Max. take-off oil inlet temperature | 60 deg. C |
| Max. continuous oil inlet temperature | 55 deg. C |
| Fuel | 87 octane + 5.35 c.c. T.E.L./gall. |